**WASHINGTON STATE ADMINISTRATIVE
OFFICE OF THE COURTS (AOC)**

APPLICATION ARCHITECTURAL STANDARDS
Version 1

PURPOSE

The term *technical standards* as used in this document include practices, specifications, and standards. These standards support the Judicial Information System (JIS) migration from a legacy procedural application architecture to a new object-oriented web application architecture.

Technical standards are put in place for software development for a variety of reasons. Standards can enforce both the way systems are developed and the composition of the final system(s). Standards can help developers produce a product that is compatible with other systems in the agency. Additionally, standards in documentation allow easier maintenance by people other than the original developer. Ultimately, technical standards provide for efficiency, value, and support for all AOC clients.

This document is a living document designed for use with all AOC applications. A standards review group designated by the Director of the Information Systems Division (ISD) shall meet at least quarterly and as needed to review the overall Application Architectural Standards document, associated links, requests for changes to the standards, and design of applications. Project managers shall have the ultimate responsibility to ensure understanding of, and compliance with, these standards. The ISD Director shall review the entire document, along with any proposed revisions, at least semi-annually.

1. HARDWARE STANDARDS

1.1. *Client Standards* (Owner: Infrastructure Project Coordinator)

    1.1.1. Intel-compatible personal computers with approved Windows operating systems and sufficient power to run current JIS applications. The current minimum system configuration is 500 MHz and 256 MB RAM.

1.2. *Server Standards* (Owner: Infrastructure Server Manager)

    1.2.1. Development: Intel-compatible personal computers with approved Windows operating systems and sufficient power to run the current version of Visual Age Java. The current minimum configuration is 800 MHz and 256 MB RAM.

    1.2.2. Production: IBM-compatible mainframe with OS/390 and sufficient power to meet performance specifications for transaction response. The current system configuration is a model 9672-RC6 with a performance rating of 340 MIPS, 2 GB main storage, 2 GB expanded storage, and 840 GB of online storage.

    1.2.3. Data Warehouse: Intel-compatible personal computers with approved Windows operating systems and sufficient power to meet performance specifications for query response. The current minimum specification is 500 MHz and 512 MB RAM.

1.3. *Network Standards* (Owner: Infrastructure Network Manager)

    1.3.1. The JIS LANs and the JIS WAN will be based on a TCP/IP transport.

    1.3.2. The JIS WAN will utilize the IGN when possible. Non-IGN WAN segments will use frame relay.

    1.3.3. LANs will use a 10 MB, 100 MB, or 1 GB Ethernet protocol.

1.4. *Availability Standards* (Owner: Infrastructure Server Manager)

    1.4.1. All components of production systems (servers, networks, and clients) shall be available from 6:00 a.m. until 3:00 a.m., seven days a week. Availability during operational hours shall be 99.6% for all system components.

1.5. *Security Standards* (Owner: Infrastructure Server Manager)

    1.5.1. All secure JIS transactions shall utilize SSL on the client and the server when the traffic runs outside of AOC's secure network.

    1.5.2. There is no current standard for application security.

2. SOFTWARE STANDARDS

2.1. *General Design Standards* (Owner: ISD Director)

2.1.1. Definitions

    2.1.1.1. Enterprise Application - An application supporting mission-critical business needs and intended for daily use by court operations staff in preferably multiple court levels, or when applicable, at least one court level. Content on the user interface presentation will typically remain static for several years.

    2.1.1.2. Non-Enterprise Application - An application aimed for use by non-court staff or not intended for daily use by operations staff in the courts. The application interface and functionality will change frequently or be of short duration.

2.1.2. All applications shall use web browser clients.

2.1.3. The software development process will comply with SEI Level 2 process requirements.

2.1.4. Enterprise applications shall implement at least three-tier designs to isolate the user interface, business logic, and data access modules.

2.1.5. Clients shall use standard HTML supported by Microsoft Internet Explorer 4.0 or greater and Netscape Navigator 4.0 or greater to avoid proprietary HTML extensions specific to a particular browser.

2.1.6. Clients shall require Java.

2.2. *User Interface (UI) Standards* (Owner: ISD Director)

2.2.1. The user interface shall comply with the standards in the Sun Microsystems JAVA Look and Feel Guidelines; approved extensions to the client/user interface standards; and templates of GUI screens incorporating the standards for JIS and in-house applications, Web-based training/computer-based training (WBT/CBT) modules, and Web pages.

2.2.2. For non-enterprise applications, the user interface will use a combination of HTML for presentation and JavaScript generated with the Cold Fusion application server for editable fields.

2.2.3. For enterprise applications, the user interface will use HTML or a Java applet (i.e. ACORDS) for presentation.

    2.2.3.1. If the user interface is HTML:

        2.2.3.1.1. JSPs and JavaScript will be used to generate the HTML.

        2.2.3.1.2. Java applets should be used within an HTML page to execute complex field edits. Java Swing components should be used when possible within an applet.

    2.2.3.2. If the user interface is created with a Java applet:

        2.2.3.2.1. Java Swing components will be used to generate as much as possible of the interface.

2.3. *Business Logic Standards*

2.3.1. The design team shall first consider reuse of design elements in existing Enterprise Java Beans and classes before creating new code; such information shall reside in the AOC production repository. Decisions not to reuse existing design elements shall be documented.

2.3.2. The design team shall next consider the use of existing patterns (future link) as the basis of new code. Decisions not to use existing patterns shall be documented.

2.4. *Database Standards* (Owner: ISD Director)

2.4.1. The design team shall reuse the existing JIS database for enterprise level applications.

2.4.2. The ISD Director must approve redundant database structure designs.

2.5. *Notation Standards* (Owner: ISD Director)

2.5.1. Use cases and use case diagrams shall be used to capture functional requirements.

2.5.2. The Unified Modeling Language (UML) shall be used to describe the use case, activity, class, and object diagrams.

2.5.3. Rational Rose shall be used as the UML tool to specify, visualize, and construct artifacts of software and systems.

2.5.4. Rational Rose shall be used as the E/R diagramming tool.

2.6. *Programming Language Standards* (Owner: ISD Director)

2.6.1. Applications shall be written in Java in compliance with the Java 2 Platform Enterprise Edition (J2EE) specification.

2.6.2. Business logic will be written as EJBs or JSPs.

2.6.3. Data exchanges with external applications will use tags compliant with the XML specification to describe the content of the data files. XML tags will also comply with the DTD defined in the Justice Common Data Architecture.

2.6.4. Java code will be generated in VisualAge for Java.

2.6.5. The Java coding shall apply the programming conventions contained in Sun Microsystems Code Conventions for the JAVA Programming Language.

2.6.6. Java code shall be tested with Rational Test and jTest.

2.6.7. Java programs will be managed using Rational ClearCase.

2.6.8. Java programs will run in WebSphere.

2.6.9. Page Designer (the editor that is shipped with WebSphere Studio) will be the standard HTML editor for Websphere applications. ColdFusion Studio Editor will be the standard for building ColdFusion applications.

2.6.10. Applications for Personal Digital Assistants (PDAs) must be based on the JAVA 2 Micro Edition (J2ME).

2.6.11. Legacy mainframe applications will be written in COBOL or Natural in compliance with ISD standards (future link).

2.7. *Persistence Standards (Enterprise Applications)* (Owner: ISD Director)

2.7.1. The default method of connection pooling is to use WebSphere facilities. Manual connection pooling may be used only to eliminate a performance bottleneck (which would include any circumstances under which WebSphere connection pooling does not work).

2.7.2. Data Access

2.7.2.1. Single table update - If a single table needs to be read and then updated, entity beans should be used for both the read and update transactions with the database.

  2.7.2.2. Multiple table updates - If multiple tables need to be read (or a single table read is very complex) and then updated, custom SQL should be written for the read transactions and entity beans should be used for the update transactions with the database.

  2.7.2.3. READ with no subsequent update - Applications will use custom SQL statements to execute read-only transactions with the database.

 2.7.3. For stored procedures, COBOL shall be used to encapsulate business rules and perform updates to the database when functionality can be shared with the legacy or new applications.

2.8. *Timing Standards* (Owner: ISD Director)

 2.8.1. At least 90% of all system transactions shall complete in less than five seconds.

 2.8.2. At least 98% of all system transactions shall complete in less than ten seconds.

2.9. *Test Standards* (Owner: Applications Process Facilitator)

 2.9.1. Developers shall use jUnit to automate their module unit tests.

 2.9.2. Testers shall use the Rational TestStudio and jTest tools to automate system regression and integration tests.

 2.9.3. Developers and testers shall use the Rational ClearQuest tool to track bugs and issues.

 2.9.4. Testers shall use the Rational RequisitePro tool to trace test cases back to baselined requirements and use case documents.

 2.9.5. Testers shall use the Rational Load-Test tool to simulate overall system performance under load.

 2.9.6. Developers and testers of legacy mainframe applications shall use the Verify © tool to automate their module unit tests.

2.10. *Usability Testing Standards* (Owner: JIS Education Services Manager)

 2.10.1. All new projects must comply with the AOC usability requirements.

3. OTHER STANDARDS

3.1. *Enterprise Functional Standards* (Owner: ISD Director)

3.1.1. Enterprise-wide cross-court level modules developed for use by all or several applications requiring common infrastructure or application services (future links to actual documented modules).

3.2. *Support Standards* (Owner: ISD Director)

3.2.1. The Help Center shall provide caller support for all applications from 7:30 a.m. to 5:30 p.m., Monday through Friday, excluding holidays.

3.2.2. The Help Center shall provide Internet self-help for all applications using the Remedy application.

3.2.3. Infrastructure shall provide operational support for all applications 21 hours per day, seven days a week.

3.2.4. Applications shall provide support for all applications from 8:00 a.m. to 5:00 p.m., Monday through Friday, excluding holidays.

3.2.5. JIS Education Services shall provide online documentation 24 hours per day, seven days a week.

3.3. *Data Warehouse Standards* (Owner: Applications OCSI Manager)

3.3.1. The hardware platform shall be an Intel-compatible PC server.

3.3.2. The operating system shall be an approved Windows OS.

3.3.3. The warehouse database shall be MS SQL Server 7.0.

3.3.4. The web-querying tool shall be Brio Insight.

3.3.5. The warehouse maintenance tool shall be Informatica.

3.3.6. The data extraction tool shall be BMC Data Mover.

3.3.7. Incremental updates will occur once a day.

3.4. *In-house Application Standards* (Owner: Information Delivery Manager)

3.4.1. The hardware platform shall be an Intel-compatible PC server.

3.4.2. The operating system shall be an approved Windows OS.

3.4.3. The back-end database will be MS SQL Server 7.0.

3.4.4. The web-querying tool shall be Brio Insight.

3.4.5. Visual Basic for Access shall be the business logic.

3.5. *Project Management Standards* (Owner: Applications Process Facilitator)

3.5.1. All project personnel shall use MS Project 98 or 2000.

3.5.2. Online templates shall be used for all required project documents.

APPENDICES

Appendix A

Standards Review Group

A standards review group designated by the Director of the Information Systems Division shall meet at least quarterly and as needed to review the overall Application Architectural Standards document, associated links, requests for changes to the standards, and design of applications.

The standards review group shall consist of the following:
1 - Standards review group coordinator (Ann Sweeney)
1 - Applications Department project manager (Randy McKown)
1 - Applications Department programmer/analyst (Elaine Evans)
1 - Information Delivery section programmer/analyst (Ferd Ang)
1 - JIS Education Services section representative (Ken Meininger)
1 - JSD representative (Janet McLane)
1 - Webmaster (Virginia Neal)
1 - Infrastructure representative (Gary Guinotte or John O'Conner)

Appendix B

Current Standard

Item	Version
Brio Insight Visual Age for JAVA	5.5 or greater
HTML	4.0
JAVA	1.3
JAVA Swing Classes	1.0
Natural	3.1.4
XML	1.0
WebSphere	3.5 EE